REMARKS/ARGUMENTS

This case has been carefully reviewed and analyzed in view of the Office Action dated 18 June 2010. Responsive to rejections made in the Office Action, Claims 1-13 and 15 have been amended and new claims 16-20 have been added. Claim 14 was previously cancelled. With this Amendment being entered, Claims 1-13 and 15-20 will be pending.

The Specification, Abstract and Claims have been amended to correct typographical errors with respect to the spelling of "illite" clay. The misspellings of "ilinite" and "ilite" have now been corrected. No new matter has been added by these changes.

In the Office Action, the Examiner rejected Claims 1-13 and 15 under 35 U.S.C. § 103(a), as being unpatentable over Bardsely, U.S. Patent No. 4,219,349, in view of Young, U.S. Patent No. 4,334,906.

Before discussing the prior art relied upon by the Examiner, it is believed beneficial to briefly review the method of the invention of the subject Patent Application, as now claimed. The present invention, as now defined in Claim 1, is directed to a granulated fertilizer. The granulated fertilizer includes a mixture of 45 to 57 wt. % of clay, 11 to 13 wt. % of iron, 3 to 9 wt. % of zinc, 0.1 to 2.5 wt. % of manganese, 0.5 to 0.7 wt. % of copper, 0 to 0.1 wt. % of molybdenum, 7 to 10 wt. % of sulphur, and 0.05 to

0.3 wt. % of a bonding agent. The mixture is formed into pellets having a size in a range of 1.5 to 4.5 millimeters.

From another aspect, as now defined in Claim 15, the present invention is directed to a method for preparing a fertilizer. The method includes the step of mixing iron sulphate, zinc sulphate, copper sulphate, manganese sulphate, ammonium molybdate and 45 to 57 wt. % of a pulverized clay selected from the one of illite, caolinite or a mixture thereof until a homogeneous mixture of dusts is obtained. The mixture thereby provides 11 to 13 wt. % of iron, 3 to 9 wt. % of zinc, 0.5 to 0.7 wt. % of copper, 0.1 to 2.5 wt. % of manganese, 0 to 0.1 wt. % of molybdenum and 7.0 to 10 wt. % sulphur as micronutrients. The method further includes the steps on feeding the mixture onto a pelletizing plate, and spraying a bonding agent in the form of a mixture of water and calcium oxide to mix with the mixture on said pelletizing plate. Further, the method includes feeding formed pellets into a drying oven to reduce a moisture content thereof. Still further, the method includes the step of sifting the dried pellets to obtain pellets having a size range of 1.5 to 4.5 millimeters.

From yet another aspect, as now defined in Claim 20, the present invention is directed to a granulated fertilizer that includes a mixture of 45 to 57 wt. % of a pulverized clay formed substantially of caolinite, 11 to 13 wt. % of iron, 3 to 9 wt. % of zinc, 0.1 to 2.5 wt. % of manganese, 0.5 to 0.7 wt. % of copper, 0 to 0.1 wt. % of molybdenum, 7 to

10 wt. % of sulphur, and a bonding agent defined by a calcium hydroxide. The mixture has a pH of 3.5 to 5.

By the claimed composition and method, the present invention provides micronutrients in optimized proportions in a delivery system that has a controlled solubility, optimized pH for assimilation of the micronutrients and a high cationic exchange capacity to further increase the assimilation of the micronutrients. The increase in cationic exchange capacity of the support structure for the micronutrients is an important characteristic of the present invention. That characteristic is achieved as a result of the particular clays from which the support structure is formed and the use of a calcium oxide composition as a bonding agent.

It is respectfully submitted that the Bardsley reference is directed to a nutrient composition for plants using calcined clay as a support structure therefore. The clay is formed by silicate minerals and montmorillinite or sepiolite, chlorite or vermiculite, which is calcined by heating at a high temperature, 500^{o} to 700^{o} C. No bonding agent is disclosed as being combined therewith by any process. The disclosed support structure for the micronutrients achieves a cationic exchange capacity that is capable of only a maximum capacity of 25 milliequivalents per 100 grams, Col. 2, lines 38-40. Nowhere is it disclosed that support structure is dried in a multi-section drying oven.

Whereas, the present invention uses a bonding agent (Claims 1, 9, 15, 16 and 20)

applied by spraying during the pelletizing process (Claim 15) and in particular a calcium oxide composition as that bonding agent (Claims 9, 15, 16 and 20), and thereby achieves a maximum capacity of 150 milliequivalents per 100 grams, page 7, lines 3-5. The present invention claims a clay formed of caolinite, illite or a mixture thereof (Claims 7 and 15), or substantially caolinite (Claims 17 and 20), or substantially ilinite (Claim 18). Nowhere does Bardsley disclose or suggest any of caolinite, ilinite or a mixture thereof. Further distinguishing, the present invention calls for 11-13 wt. % of iron, 3 to 9 wt. % of zinc and 7.0 to 10 wt. % sulphur (Claims 1, 15 and 20). In fact, the reference teaches away from such concentrations by its disclosure of a mixture with 0.1 to 5.0 wt. % of iron, 0.02 to 2.0 wt. % of zinc and 1.0 to 5.0 of sulphur. Still further, Bardsley nowhere discloses the composition as having a pH in the range of 3.5 to 5 (Claims 11, 16 and 20). In the present invention, the formed particulates are dried by passing them through a multi-section oven having temperatures that vary from 90° C to 40° C (Claim 19) which is nowhere disclosed or suggested by Bardsley.

The Young reference does not overcome the deficiencies of Bardsley. The Young reference is directed to a particulate slow release soil amendment and micronutrient source. Rather than using clay as a support structure for the micronutrients, this reference uses porous sulfur particulates as the support structure. The particulates are formed from molten sulfur and certain of the micronutrients may be incorporated in the molten sulfur

phase. Nowhere does the reference disclose or suggest the use of any compound as a bonding agent, let alone calcium oxide or calcium hydroxide, and as the referenced particulates are formed by solidifying the molten sulfur rapidly using pressurized water, no bonding agent is necessary.

Micronutrients that are added to the sulfur in the molten phase are those that are initially insoluble in water or form insoluble sulfides in situ. As the particulates are formed in the presence of water, it is desirable that the micronutrients not leach out during that process, Col. 9, lines 19-38. Examples of slightly soluble starting compounds for incorporation in the molten sulfur include calcium magnesium carbonate and calcium molybdate. Contrary to the Examiner's interpretation, the undersigned attorney can find no disclosure of calcium oxide being added to the molten sulfur. *Arguendo*, even if the reference disclosed calcium oxide as being added to the molten sulfur as a nutrient composition, as a plant nutrient, it still nowhere discloses it as a bonding agent. Further, if it discloses calcium oxide as being added to the molten sulfur, due to its slight solubility in water, there would be no motivation for adding that composition to the nutrient composition of Bardsley, which depends on water soluble micronutritive materials. Further, it would be counter intuitive to add a material such as calcium oxide that readily forms an hydroxide in the presence of water to a composition that is to have a pH 3.5 to 5, as in the present invention.

With respect to pH of the Young particulate, the reference notes the known fact that plant absorption of the micronutrients is facilitated by an acidic soil environment. The reference further notes that such an acidic environment can be in a localized area. Rather than disclosing a particulate with an acidic pH, the referenced porous sulfur support structure forms sulfuric acid by oxidation of the sulfur and exposure to moisture, Col. 7, lines 54-58. Thus, the localized acidic pH is a function of the decomposition of the sulfur matrix supporting the micronutrients and not the pH of the micronutrient particulate, as formed.

Thus, the combination of Bardsley and Young fail to disclose, suggest or present any other reason for providing a mixture of 45 to 57 wt. % of clay, 11 to 13 wt. % of iron, 3 to 9 wt. % of zinc, 0.1 to 2.5 wt. % of manganese, 0.5 to 0.7 wt. % of copper, 0 to 0.1 wt. % of molybdenum, 7 to 10 wt. % of sulphur, and 0.05 to 0.3 wt. % of a bonding agent, as claimed in Claim 1; or the clay is selected from the group consisting of caolinite, illite or a mixture thereof, as defined in Claim 7; or the mixture of clays contains from 0 to 15% iron, based on a total weight of the mixture of clays, as defined in Claim 8; or the clay is formed substantially of caolinite, as claimed in Claim 17; or the clay is formed substantially of illite, as claimed in Claim 18. The combination of Bardsley and Young further fail to disclose, suggest or present any other reason for providing the bonding agent being a calcium oxide composition, as claimed in Claim 9;

or the calcium oxide composition is calcium hydroxide, and said granulated fertilizer has a pH of 3.5 to 5, as claimed in Claim 16; or the granulated fertilizer has a pH of 3.5 to 5, as claimed in Claim 11, or drying the formed pellets in a multi-section oven having temperatures that vary from 90° C to 40° C, as claimed in Claim 19. Nor does the combination of references disclose, suggest or present any other reason for providing the method step of mixing iron sulphate, zinc sulphate, copper sulphate, manganese sulphate, ammonium molybdate and 45 to 57 wt. % of a pulverized clay formed of one of illite, caolinite or a mixture thereof until a homogeneous mixture of dusts is obtained to provide 11 to 13 wt. % of iron, 3 to 9 wt. % of zinc, 0.5 to 0.7 wt. % of copper, 0.1 to 2.5 wt. % of manganese, 0 to 0.1 wt. % of molybdenum and 7.0 to 10 wt. % sulphur as micronutrients; or the step of spraying a bonding agent in the form of a mixture of water and calcium oxide to mix with said mixture on said pelletizing plate, as defined in Claim 15. Still further, the combination of Bardsley and Young fail to disclose, suggest or present any other reason for providing a mixture of 45 to 57 wt. % of a pulverized clay formed substantially of caolinite, 11 to 13 wt. % of iron, 3 to 9 wt. % of zinc, 0.1 to 2.5 wt. % of manganese, 0.5 to 0.7 wt. % of copper, 0 to 0.1 wt. % of molybdenum, 7 to 10 wt. % of sulphur, and a bonding agent defined by a calcium hydroxide, and said mixture having a pH of 3.5 to 5, as defined in Claim 20.

As the combination of Bardsley and Young fail to disclose, suggest or present any

other reason for providing the concatenation of limitations that form the present invention, they cannot make that invention obvious.

It is believed that the dependent claims not specifically discussed add further patentably distinct limitations, but are at least patentably distinct for the same reasons as independent Claims upon which they are respectfully dependent, and therefore should be allowable as well.

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectfully requested.

No fees are believed to be due with this Amendment. If there are any charges associated with this filing, the Honorable Director of Patents and Trademarks is hereby authorized to charge Deposit Account #50-5298 for such charges.

Respectfully submitted,
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